Input to Water Heating Roadmap Meeting from Everett Barber, Jr.
Sunsearch, Incorporated

Background for Everett Barber, Jr.: I operate a solar business in Southern New England. We have a bit over 8000 systems that we service. Most are orphaned systems. Most are solar water heating systems, but also included in that 8000 are solar pool heating, solar space heating and solar electric systems. We design, install and service solar thermal and solar electric systems. Rather than use off-the-shelf systems, we design our own systems. We probably fit the category of system integrator. In any given year between 40 and 60 percent of our business is service of existing solar systems. The balance is the installation of new systems. Our company, Sunsearch, Inc. has been in the solar energy business since 1975.

I would argue that solar water heating is a reasonably mature technology, probably not far behind solar pool heating in its evolution.

The problems that businesses in this industry face have more to do with the need for consumer education and small refinements to the products than with the development of new technology.

A solar component manufacturer, may disagree with the following: a solar water heating system that is 10 or 20 or even 30 percent more efficient, or one that is 10 or 20 or 30 percent less expensive than currently available solar systems is of less importance to the widespread use of solar water heating than some of the items listed below. A solar component manufacturers business is to supply products to the person in the field dealing with the customers and prospects. We have worked in both roles. We are now in the latter.

Some of the realities of this business, as we see them are:

1.) There is the need for an on-going effort to combat consumer ignorance.

A very disheartening aspect of this business is the rate at which existing solar water heating systems are removed, even systems that were put in as recently as 3 years ago.

A lot of systems are removed by new owners who are ignorant of their benefits, or for whom those benefits are of no consequence. To combat this attrition, we spend a lot of time convincing the new owners of existing systems that the systems are worth keeping. This is done one-on-one on the phone, with a newsletter, and with a booklet that we have developed for this exact purpose. In addition to the new owners, there are other enemies of existing solar systems which include, real estate agents; home inspectors, and roofing contractors.

The real estate agents often tell the seller or the buyer to take down the system, because 'they are ugly, don't work, the technology is antiquated, and no one is using them any more.

The average home inspector knows little about solar water heating systems. They often exclude the system from their inspection. And they frequently tell the buyer that 'most of them don't work.' This does not give a prospective buyer much confidence in the system.

The roofing contractor often tells the homeowner that the systems are a nuisance, they are in their way, they cause the roof to leak, 'they usually put them in the trash.'

Perhaps a government sponsored website that intelligently explains the benefits of a solar water heating system could be made available. Prospective sellers, buyers, real estate agents, etc. could be referred to the site. I know that such a site would be helpful to us. If it were a federal government sponsored website it would carry more credibility than would a business.

2.) Finding qualified and licensed technicians and installers is difficult:

This is a major problem in our region. The trade schools in Connecticut, Rhode Island, Massachusetts, and New York do not provide any training in the renewable energy area. They have no 'solar curriculum.' Other than in Connecticut, which has a limited solar water heating license, there is no other state in the Northeast that has a limited, or unlimited, solar license. In New York State, where there is no statewide licensing, each community requires a trade license issued in that community. In that case, it is very difficult to move from one community to the next with a qualified solar technician or installer.

In general, plumbers, heating contractors, and electricians do not know how to install solar systems, and, for the most part they are not interested. Almost daily we come upon work done by plumbing, heating, and fuel oil service technicians that greatly compromises the performance of the system.

A certification program for either solar thermal or solar electric system installations would be useful only if it trains tradesmen who already have licenses. To train, or 'certify' someone who does not have a trade license is of little value since that person can neither 'pull a permit to install a system' nor work on a job where licensed installers or service technicians are required. Several national certification programs have been proposed and, in my estimation, they are doomed to failure unless they train licensed tradesmen.

A couple of years ago Rhode Island ran weeklong workshops to 'certify' solar electric and solar thermal installers. The workshops were open to all who were interested. The attendees were led to believe that once they completed the course they could then install such systems. That was not the case. The state department of labor would only recognize the certification if the people completing the workshop were licensed tradesmen. Bad coordination, that one.

3.) Hardware Issues:

There are two particularly costly operations that often jeopardize the continued existence of solar water heating systems.

a.) Removal and Remounting of collectors for reshingling the roof. Shingle covered roofs are the norm in the Northeast. Shingles of average life typically last 20 to 25 years. Roofing contractors prefer to have solar panels removed when the roof is reshingled. This allows them to put down a complete membrane over the entire roof, thereby minimizing the likelihood of a leak developing. The solar panels are then remounted over the new shingles. Ideally, the solar contractor assumes the responsibility for any leaks that develop in the roof near the solar panels.

This is an expensive operation, to remove and later remount the collector array, particularly if the original mounting frame must be replaced. Quite a few homeowners, when confronted with the cost of removing and remounting the solar array plus the cost of reshingling, opt to have the solar system removed.

While using 40 or 50 year shingles, and making sure a new roof is in place when a system is installed, a government sponsored website that presented the merits of solar water heating should help reduce the number of systems removed for this reason.

b.) Replacing a leaking solar tank:

Usually, the solar hot water storage tank is second only to the collector array in cost. When the solar tank leaks the cost to replace the tank can be an appreciable fraction of the installed cost of the system. If a system owner is uncertain of the merit of the system, then he or she is quite likely to remove the system rather than replace the leaking solar tank.

In the northeast, most solar tanks are stone-lined steel, with an internal heat exchange coil. These tanks have a rather poor track record as far as longevity is concerned. Their average life is on the order of 8 to perhaps 14 years. The next most common tank is a glass lined steel tank. These are used where external heat exchangers are used. The glass lined steel tanks don't last as long as the stone-lined tanks. Typical glass lined tanks last between 6 and 12 years. Stainless steel tanks are gradually replacing both the stone lined steel and the glass lined tanks but these are quite a bit more expensive.

This is an area where a less expensive, long lasting, product would be very desirable.

c.) New SDHW systems to develop:

In warmer parts of the US, where freezing weather does not occur, or seldom occurs, it seems the long range solution for the mass market we all hope will happen should be some type of unitary system, like the ICS systems. They can be installed appliance-like, quickly and economically. When there is no hot water demand for extended periods they simply vent the excess hot water to the roof. The only shortcoming that I have seen to the present ICS products when used in non-freezing climates, is their weight. Over time, they will cause roof deflection, unless the installer makes the effort to reinforce the roof beneath them.

In the Northeast, we know of no remaining ICS type systems. The few that were installed during the early 1980's have been removed. In the few cases that we have been able to investigate, they were removed because the potable water lines froze during a power outage. The freezing occurred where the lines passed through the roof. When the lines thawed, water did considerable damage to the interior of the houses where the systems were installed. Active, open loop, SDHW systems have suffered the same fate in this climate. If such systems are used in this climate at all, they are used during non-freezing weather.

Maybe someone can come up with a unitary system that does not have the risk of freeze damage to the water supply and return lines.

A system concept that could use further development is what was known as the Copper Crickett. The company (Sage

Advance?) has been out of business for some years. Perhaps the patents have expired? A lot was good about that concept, but there was one serious flaw. The system could not deal with extended periods of no hot water demand during the summer. The system overheated and the 'thermal fuse' in the 'percolation tube' would melt causing the collection loop to loose its charge. When that happened, the system would stop working. While covering the collectors when an owner leaves a house for a few days during the summer may be an option for solar aficionados, it is not an option for the average homeowner. They won't bother. Perhaps a dozen Crickets were installed in this area. We know of none that are still working. A second drawback to those systems is the limitation in elevation between the collectors and the pad type heat exchanger. That limit seemed to be about 30 feet. Yet another drawback was the fact that they required trained service technicians. They could not be serviced by the average plumber or heating contractor. Perhaps refinements to this system could make it more acceptable.